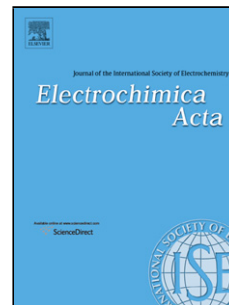


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The catalytic effect of CeO₂ for electrochemical oxidation of graphite in molten carbonate

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Abstract

Direct carbon fuel cell are promising power sources with their performance significantly depending on the anode reaction. In this study, the CeO₂ prepared by a Sol-Gel method was investigated as the catalyst for the graphite electrooxidation in the molten alkali carbonate. Ceria and graphite powders with different mass ratios were first homogeneously mixed and then pressed into electrodes for the electrochemical measurements. Results indicated that the performance of graphite electrooxidation was remarkably improved by the addition of CeO₂. The current density of the graphite electrooxidation with 50 wt.% ceria reaches 196 mA cm⁻² at -0.4 V vs. Au/CO₃²⁻/O₂, 2CO₂ and 750 °C, which is considerably higher than that of pure graphite electrode (117 mA cm⁻²). The reaction mechanism relative to the ceria catalytic effect was explained by the indirect electrooxidation pathways via preceding

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